

function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution; a first solubilizing quantity of a non-ionic surfactant effective to solubilize said demulsifier in said aqueous solution, said non-ionic surfactant comprising an alkoxyated compound having the following general formula:



wherein

$R^6$  is an alkyl group having from about 8 to about 16 carbon atoms;

$R^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$R^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$x$  is from about 2 to about 20; and

a second solubilizing quantity of a mutual organic solvent selected from the group consisting of water soluble glycol ethers, water soluble amides, water soluble ketones, and water soluble alcohols selected from the group consisting of methanol, ethanol, 1-propanol, and 2-propanol, said mutual organic solvent being effective to solubilize said demulsifier and said non-ionic surfactant to produce said demulsifier composition.

145. (New) The composition of claim 144 wherein said aqueous solution is a brine.

146. (New) The composition of claim 144 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

147. (New) The composition of claim 144 wherein

said demulsifying amount of said demulsifier is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.  
C<sup>1</sup>

148. (New) The composition of claim 144 wherein

said demulsifying amount of said demulsifier is from about 2 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.  
C<sup>1</sup>

149. (New) The composition of claim 145 wherein

said demulsifying amount of said demulsifier is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.  
C<sup>1</sup>

150. (New) The composition of claim 145 wherein

said demulsifying amount of said demulsifier is from about 2 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.  
C<sup>1</sup>

151. (New) The composition of claim 146 wherein

said demulsifying amount of said demulsifier is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

152. (New) The composition of claim 146 wherein said demulsifying amount of said demulsifier is from about 2 wt.% to about 10 wt.%; and said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.

153. (New) The demulsifier composition of claim 144 wherein said mutual organic solvent is selected from the group consisting of water soluble propylene glycol ethers, N,N-dimethylformamide, N,N-dimethylacetamide, 1-methyl-2-pyrrolidinone, acetone, methanol, ethanol, 1-propanol and 2-propanol.

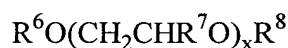
C! 154. (New) The demulsifier composition of claim 144 wherein said demulsifier comprises an amine salt of a sulfonic acid.

155. (New) The demulsifier composition of claim 144 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, phosphated fatty alcohol ethoxylates such as phosphated oleyl or tridecyl ether having from about 2 to about 10 moles of ethoxylation.

156. (New) A demulsifier composition comprising:  
a demulsifying amount of a demulsifier effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution, said demulsifier being selected from the group consisting of oxyalkylated alkyl phenol resins, oxyalkylated amines, glycol resin esters, bisphenol glycol ethers, bisphenol glycol

esters, salts of alkylaryl sulfonic acid, dicarbamates, oxyalkylated polyols reacted with compounds selected from the group consisting of diepoxides and polycarboxylic acids, unreacted oxyalkylated polyols, and unreacted oxyalkylated phenolic resins;

a first solubilizing quantity of a non-ionic surfactant effective to solubilize said demulsifier in said aqueous solution, said non-ionic surfactant comprising an alkoxyated compound having the following general formula:



wherein

$R^6$  is an alkyl group having from about 8 to about 16 carbon atoms;

$R^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$R^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

x is from about 2 to about 20; and

a second solubilizing quantity of a mutual organic solvent comprising one or more water-soluble alkanol ethers having the formula



wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms; and

z is from about 1 to about 22.

157. (New) The composition of claim 156 wherein

R<sup>10</sup> and R<sup>11</sup> are hydrogen;

R<sup>12</sup> is selected from the group consisting of methyl, ethyl, propyl, iso-propyl, and butyl groups;

z is from about 1 to about 8.

158. (New) The composition of claim 156 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether.

159. (New) The composition of claim 156 wherein said demulsifier is a 2-propanamine salt of dodecyl benzene sulfonic acid.

C 160. (New) The composition of claim 156 wherein said non-ionic surfactant has a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20.

161. (New) The composition of claim 156 wherein said non-ionic surfactant has a HLB value of about 8 to about 15.

162. (New) The composition of claim 156 wherein

said demulsifying amount of said demulsifier is from about 1 wt.% to about 40 wt.%;

said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about

10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about

98 wt.%.

163. (New) The composition of claim 156 wherein

said demulsifying amount of said demulsifier is from about 2 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.  
C!

164. (New) The composition of claim 157 wherein  
said demulsifying amount of said demulsifier is from about 1 wt.% to about 40 wt.%;  
said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and

said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

165. (New) The composition of claim 157 wherein  
said demulsifying amount of said demulsifier is from about 2 wt.% to about 10 wt.%; and  
said second solubilizing quantity of said mutual organic solvent is from about 85 wt.% to about 95 wt.%.

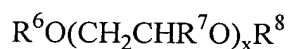
166. (New) The composition of claim 158 wherein  
said demulsifying amount of said demulsifier is from about 1 wt.% to about 40 wt.%;  
said first solubilizing quantity of said non-ionic surfactant is from about 1 wt.% to about 10 wt.%; and  
said second solubilizing quantity of said mutual organic solvent is from about 60 to about 98 wt.%.

167. (New) The composition of claim 158 wherein  
said demulsifying amount of said demulsifier is from about 2 wt.% to about 10 wt.%; and  
said second solubilizing quantity of said mutual organic solvent is from about 85 to about 95 wt.%.


168. (New) A demulsifier composition to prevent or resolve downhole emulsions in aqueous solutions, said demulsifier composition comprising:

a demulsifying amount of a 2-propanamine salt of dodecyl benzene sulfonic acid effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution;

a first solubilizing quantity of an alcohol ethoxylate having the following general formula



wherein

  $R^6$  is an alkyl group having from about 8 to about 16 carbon atoms;

$R^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$R^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

x is from about 2 to about 20; and

a second solubilizing quantity of a mutual organic solvent selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

169. (New) The composition of claim 168 wherein

$R^6$  is a linear alkyl group having from about 14 to about 15 carbon atoms; and

x is from about 5 to about 10.

170. (New) The composition of claim 168 wherein said aqueous solution is a brine.

171. (New) The composition of claim 169 wherein said aqueous solution is a brine.

172. (New) The composition of claim 168 wherein  
said demulsifying amount of said 2-propanamine salt of dodecyl benzene sulfonic acid is  
from about 1 wt.% to about 40 wt.%;  
said first solubilizing quantity of said alcohol ethoxylate is from about 1 wt.% to about 10  
wt.%; and  
said second solubilizing quantity of said mutual organic solvent is from about 60 wt.% to  
about 98 wt.%.

C! 173. (New) The composition of claim 168 wherein  
said demulsifying amount of said 2-propanamine salt of dodecyl benzene sulfonic acid is  
from about 2 wt.% to about 10 wt.%; and  
said second solubilizing quantity of said mutual organic solvent is from about 85 wt.% to  
about 95 wt.%.

174. (New) The composition of claim 169 wherein  
said demulsifying amount of said 2-propanamine salt of dodecyl benzene sulfonic acid is  
from about 1 wt.% to about 40 wt.%;  
said first solubilizing quantity of said alcohol ethoxylate is from about 1 wt.% to about 10  
wt.%; and  
said second solubilizing quantity of said mutual organic solvent is from about 60 wt.% to  
about 98 wt.%.

175. (New) The composition of claim 169 wherein  
said demulsifying amount of said 2-propanamine salt of dodecyl benzene sulfonic acid is  
from about 2 wt.% to about 10 wt.%; and



said second solubilizing quantity of said mutual organic solvent is from about 85 wt.% to about 95 wt.%.

176. (New) A demulsifier composition to prevent or resolve downhole emulsions in aqueous solutions, said demulsifier composition comprising:

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a demulsifying amount of a demulsifier selected from the group consisting of oxyalkylated alkyl phenol resins, oxyalkylated amines, glycol resin esters, bisphenol glycol ethers, bisphenol glycol esters, salts of alkylaryl sulfonic acid, dicarbamates, oxyalkylated polyols reacted with compounds selected from the group consisting of diepoxides and polycarboxylic acids, unreacted oxyalkylated polyols, and unreacted oxyalkylated phenolic resins effective to perform a function selected from the group consisting of demulsifying an emulsion in an aqueous solution and preventing formation of an emulsion in an aqueous solution;

a first solubilizing quantity of a non-ionic surfactant selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation; and

a second solubilizing quantity of a mutual organic solvent selected from the group consisting of water soluble glycol ethers, water soluble amides, water soluble ketones, and water soluble alcohols selected from the group consisting of methanol, ethanol, 1-propanol, and 2-propanol, said mutual organic solvent being effective to solubilize said demulsifier and said non-ionic surfactant to produce said demulsifier composition.

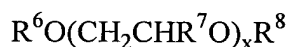
177. (New) A brine comprising a fluid selected from the group consisting of a drilling fluid, a workover fluid, and a completion fluid, said brine comprising:

a demulsifying amount of a demulsifier selected from the group consisting of oxyalkylated alkyl phenol resins, oxyalkylated amines, glycol resin esters, bisphenol glycol ethers, bisphenol glycol esters, salts of alkylaryl sulfonic acid, dicarbamates, oxyalkylated polyols reacted with compounds selected from the group consisting of diepoxides and polycarboxylic acids, unreacted oxyalkylated polyols, and unreacted oxyalkylated phenolic resins effective to perform a function selected from the group consisting of demulsifying an emulsion in said aqueous solution and preventing formation of an emulsion in said aqueous solution;

C) a first solubilizing quantity of a non-ionic surfactant effective to solubilize said demulsifier in said aqueous solution;

a second solubilizing quantity of a mutual organic solvent selected from the group consisting of water soluble glycol ethers, water soluble amides, water soluble ketones, and water soluble alcohols selected from the group consisting of methanol, ethanol, 1-propanol, and 2-propanol, said mutual organic solvent being effective to solubilize said demulsifier and said non-ionic surfactant to produce said brine.

178. (New) The brine of claim 177 wherein said non-ionic surfactant comprises an alkoxyated compound having the following general formula:



wherein

$R^6$  is an alkyl group having from about 8 to about 16 carbon atoms;

$R^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$R^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

x is from about 2 to about 20.

179. (New) The brine of claim 177 wherein said non-ionic surfactant has an HLB of from about 8 to about 15.

180. (New) The brine of claim 178 wherein said non-ionic surfactant has an HLB of from about 8 to about 15.

C 181. (New) The brine of claim 177 wherein said mutual organic solvent is selected from the group consisting of water soluble propylene glycol ethers, N,N-dimethylformamide, N,N-dimethylacetamide, 1-methyl-2-pyrrolidinone, acetone, methanol, ethanol, 1-propanol and 2-propanol.

182. (New) The brine of claim 178 wherein said mutual organic solvent is selected from the group consisting of water soluble propylene glycol ethers, N,N-dimethylformamide, N,N-dimethylacetamide, 1-methyl-2-pyrrolidinone, acetone, methanol, ethanol, 1-propanol and 2-propanol.

183. (New) The brine of claim 179 wherein said mutual organic solvent is selected from the group consisting of water soluble propylene glycol ethers, N,N-dimethylformamide, N,N-dimethylacetamide, 1-methyl-2-pyrrolidinone, acetone, methanol, ethanol, 1-propanol and 2-propanol.

184. (New) The brine of claim 180 wherein said mutual organic solvent is selected from the group consisting of water soluble propylene glycol ethers, N,N-dimethylformamide, N,N-dimethylacetamide, 1-methyl-2-pyrrolidinone, acetone, methanol, ethanol, 1-propanol and 2-propanol.

185. (New) The brine of claim 177 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

186. (New) The brine of claim 178 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

187. (New) The brine of claim 179 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

188. (New) The brine of claim 180 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

189. (New) The brine of claim 181 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15

moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

190. (New) The brine of claim 182 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

191. (New) The brine of claim 183 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

C 192. (New) The brine of claim 184 wherein said non-ionic surfactant is selected from the group consisting of polyoxyalcohols, tall oil ethoxyethylate having from about 6 to about 15 moles of ethylene oxide, ethoxylated nonylphenols, and phosphated fatty alcohol ethoxylates having from about 2 to about 10 moles of ethoxylation.

193. (New) The brine of claim 177 wherein said demulsifier comprises an amine salt of a sulfonic acid.

194. (New) The brine of claim 178 wherein said demulsifier comprises an amine salt of a sulfonic acid.

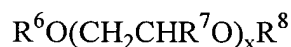
195. (New) The brine of claim 183 wherein said demulsifier comprises an amine salt of a sulfonic acid.

196. (New) The brine of claim 184 wherein said demulsifier comprises an amine salt of a sulfonic acid.

197. (New) The brine of claim 191 wherein said demulsifier comprises an amine salt of a sulfonic acid.

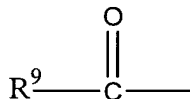
198. (New) The brine of claim 192 wherein said demulsifier comprises an amine salt of a sulfonic acid.

199. (New) The brine of claim 177 wherein said non-ionic surfactant comprises an alkoxyated compound having a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20 and having the following general formula:



wherein

C<sup>1</sup>  
R<sup>6</sup> independently is selected from the group consisting of hydrogen, acyl groups and alkyl groups having from about 1 to about 22 carbon atoms, said acyl groups having the following general formula:



wherein R<sup>9</sup> is an alkyl group having from about 1 to about 24 carbon atoms;

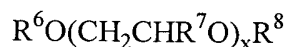
R<sup>7</sup> independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

R<sup>8</sup> is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

and

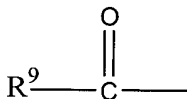
x is from about 1 to about 20.

200. (New) The brine of claim 183 wherein said non-ionic surfactant comprises an alkoxylated compound having a hydrophilic-lipophilic balance (HLB) value of from about 5 to about 20 and having the following general formula:



wherein

$R^6$  independently is selected from the group consisting of hydrogen, acyl groups and alkyl groups having from about 1 to about 22 carbon atoms, said acyl groups having the following general formula:



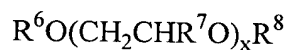
wherein  $R^9$  is an alkyl group having from about 1 to about 24 carbon atoms;

$R^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$R^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms; and

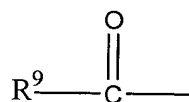
x is from about 1 to about 20.

201. (New) The brine of claim 198 wherein said non-ionic surfactant comprises an alkoxylated compound having the following general formula:



wherein

$R^6$  independently is selected from the group consisting of hydrogen, acyl groups and alkyl groups having from about 1 to about 22 carbon atoms, said acyl groups having the following general formula:



wherein  $R^9$  is an alkyl group having from about 1 to about 24 carbon atoms;

$R^7$  independently is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

$R^8$  is selected from the group consisting of hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;

and

x is from about 1 to about 20.

202. (New) The brine of claim 177 wherein said mutual organic solvent comprises one or more water soluble alkanol ethers having the formula



wherein



$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of  
hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;  
and  
z is from about 1 to about 22.

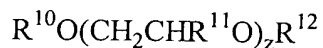
203. (New) The brine of claim 183 wherein said mutual organic solvent comprises one or more water soluble alkanol ethers having the formula



wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of  
hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;  
and  
z is from about 1 to about 22.

C 204. (New) The brine of claim 198 wherein said mutual organic solvent comprises one or more water soluble alkanol ethers having the formula



wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of  
hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;  
and  
z is from about 1 to about 22.

205. (New) The brine of claim 201 wherein said mutual organic solvent comprises one or more water soluble alkanol ethers having the formula



wherein

$R^{10}$ ,  $R^{11}$  and  $R^{12}$  independently are selected from the group consisting of  
hydrogen and alkyl groups having from about 1 to about 6 carbon atoms;  
and  
z is from about 1 to about 22.

206. (New) The brine of claim 177 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

207. (New) The brine of claim 183 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

208. (New) The brine of claim 198 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

209. (New) The brine of claim 201 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).

210. (New) The brine of claim 205 wherein said mutual organic solvent is selected from the group consisting of ethylene glycol monobutyl ether (EGMBE) and ethylene glycol monomethyl ether (EGMME).